Forecasting the Yield Curve: An Econometric Study

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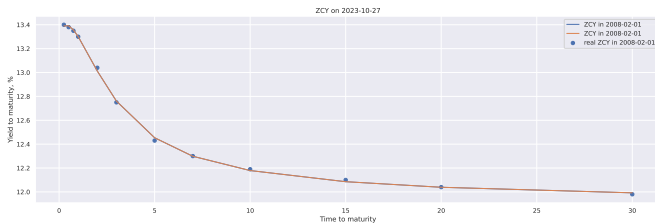Lomonosov Moscow State University

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YC and data

Figure: Yield Curve

$$G(T) = \beta_0 + (\beta_1 + \beta_2)\frac{\tau}{T}\left(1 - e^{-\frac{T}{\tau}}\right) - \beta_2 e^{-\frac{T}{\tau}}, \tag{1}$$

where T is the time to maturity, $G(T)$ is the yield estimator, and the parameters to be estimated are: β_0 is the long-run of zero-bond yields, β_1 is the mid-run of zero-bond yields, β_2 is the short-run of zero-bond yields.
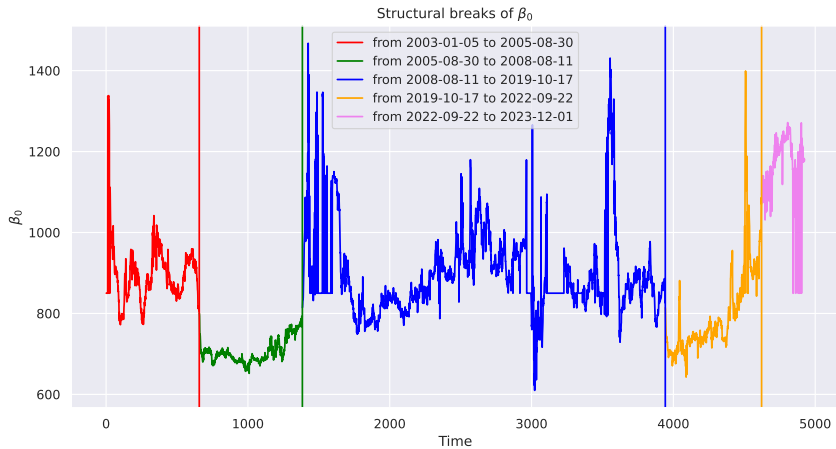
Structural breaks in factors

Figure: Yield Curve

Structural breaks in factors

1. 2005: The complete stabilization of the Russian economy, the war in Iraq.
2. 2008: the Russo-Georgian Conflict and the beginning of the world finanical crisis.
3. 2018: protests from March 2017 to the end of 2018. Also, it was a 2018 FIFA World Cup.
4. 2020: COVID-19 pandemic.
5. 2022: special military operation.

Structural breaks

Factor	MAPE	MAE	RMSE
β_0	0.006	5.5102	6.0729
β_1	0.3471	29.3697	32.2907
β_2	0.5223	93.8611	95.6724
τ	0.9588	1.8988	1.987

Table: NS factors forecasting results using ARIMA for the last segment.

Factor	MAPE	MAE	RMSE
β_0	0.0139	12.8457	14.9255
β_1	0.134	12.1766	15.9566
β_2	0.3394	60.4861	61.5831
τ	0.3582	0.68	0.7972

Table: NS factors forecasting results using VAR for the last segment.
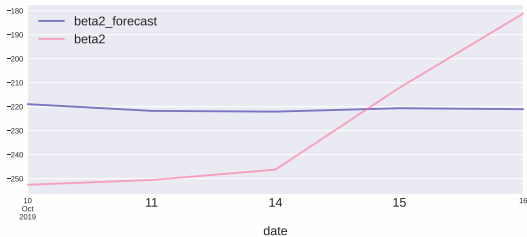
Nelson-Siegel factors forcast using ARIMA

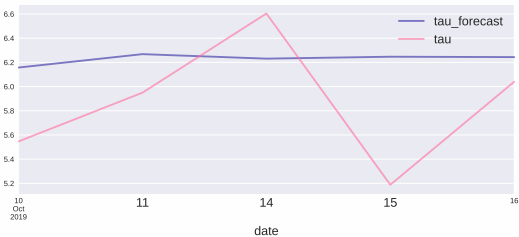# Nelson-Siegel factors forcast using VAR